

REMARKS**I. Drawings**

In the Office Action, the Examiner has objected to the drawings as failing to comply with 37 CFR 1.83(a). The Examiner alleges that the drawings do not show every feature of the invention as specified in the claims. Applicant has added new Figure 5 on the attached sheet of drawings to show how the mold compound gets underneath and captures the wire as requested by the Examiner. A new Brief Description of the Drawings and a brief write up describing the Figure 5 has been added consistent with the patent application as originally filed. No new matter has been added. Thus, Applicant respectfully submits that the Examiner's objection to the drawings has been effectively traversed. Such action is earnestly solicited.

II. 35 U.S.C. § 103(a)

In the Office Action, the Examiner has rejected Claims 1 and 14 under 35 U.S.C. 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamada et al., U.S. Patent 6,177,725 in view of Huang, U.S. Patent 6,396,139. The Examiner has rejected Claims 4-7 as allegedly being unpatentable over Yamada et al., U.S. Patent 6,177,725 in view of Huang, U.S. Patent 6,396,139, and further in view of Nakamichi, U.S. Patent 6,127,206. The Examiner has rejected Claims 8, 11 and 24-25 as allegedly being unpatentable over Yamada et al., U.S. Patent 6,177,725. The Examiner has

rejected Claims 10 and 26 as allegedly being unpatentable over Yamada et al., U.S. Patent 6,177,725 in view of Huang, U.S. Patent 6,396,139. The Examiner has rejected Claims 12-13 as allegedly being unpatentable over Yamada et al., U.S. Patent 6,177,725 in view of Nakamichi, U.S. Patent 6,127,206. The Examiner has rejected Claims 8-9, 11, 13-14, and 24-25 as allegedly being unpatentable over Minamio et al., U.S. Patent 6,208,020. Applicant respectfully disagrees.

Applicant claims a semiconductor assembly which has a plurality of channels formed in a top surface of the die flag area on the leadframe. The channels are used for promoting adhesion to prevent delamination of the semiconductor assembly. A mold compound for encapsulating the semiconductor assembly flows into the plurality of channels and bonds with the plurality of channels forming a lock between the mold compound and the die flag area to prevent delamination of the semiconductor assembly. The plurality of channels are formed on the top surface of the die flag area. The semiconductor assembly has raised wire bonding areas. The raised wire bonding areas are on the die flag area and are used for wirebonds. The plurality of raised wire bonding areas allow the mold compound to get underneath a wire coupled to the raised bonding area and capture the wire to increase reliability of the wirebond.

In contrast, Yamada et al. (hereinafter Yamada) neither discloses nor anticipates a plurality of channels used to prevent delamination. Yamada does not disclose or anticipate channels on

the top surface of the die pad for allowing the mold compound to flow into the channels and bond with the channels in order to form a lock between the mold compound and the leadframe to prevent delamination of the semiconductor assembly. Yamada does show grooves but the grooves are used to couple a die to the die pad. Applicants place the plurality of channels on exposed areas of the die pad where better adhesion is required between the mold compound and the die pad in order to prevent delamination. The grooves in Yamada perform a totally different function. The grooves in Yamada do not prevent delamination of the semiconductor assembly (i.e., between the leadframe and the encapsulant). The groove in Yamada are formed in order to avoid forming a chip mounting area (Column 6, lines 11-13). Nowhere is it disclosed or anticipated that the grooves in Yamada are used to prevent delamination of the semiconductor assembly. Applicant is using the channeling for an entirely different purpose than that disclosed in Yamada.

To further patentably distinguish Applicant's claimed invention from Yamada, Applicant has a plurality of raised wire bond areas on the die flag area. The plurality of raised wire bond areas on the leadframe are used for wirebonds. The raised wire bond areas allow the mold compound to get underneath the wirebonds and capture the wirebonds to increase reliability of the wirebonds. Yamada fails to disclose or anticipate the plurality of raised areas on the leadframe used for wirebonds. The Examiner contends that Huang discloses the raised areas. Applicant respectfully disagrees. Huang discloses leads 50b. The leads 50b are exposed

to the outside of the encapsulation body (See Column 4, Lines 17-24). Huang fails to disclose or anticipate raised areas which allow the mold compound to get underneath the wirebonds and capture the wirebonds to increase reliability of the wirebonds.

Applicant claims different shaped grooves formed on the top surface of the leadframe. As stated above, the grooves allow the mold compound to flow into the channels and bond with the channels in order to form a lock between the mold compound and the leadframe to prevent delamination of the semiconductor assembly. The Examiner contends that Nakamichi discloses the different shape grooves. Applicant respectfully disagrees. Nakamichi discloses a single groove in each lead not on the die pad. The groove in the lead is used to enhance the reliability and accuracy of optical detection during wirebonding. The groove is used to increase wirebonding strength by extending the bonding area (see column 2, lines 20-27). Nakamichi does not disclose or anticipate using the grooves to allow the mold compound to flow into the channels and bond with the channels in order to form a lock between the mold compound and the leadframe to prevent delamination of the semiconductor assembly.

The Examiner also contends that Minamio et al. Discloses a plurality of "U" shaped channels on the top surface of the leadframe. Applicant respectfully disagrees. Applicant has reviewed Figures 1A-1B and has read the entire patent. Nowhere does Minamio discloses or anticipate using a plurality of "U" shape grooves to allow the mold compound to flow into the channels and

bond with the channels in order to form a lock between the mold compound and the leadframe to prevent delamination of the semiconductor assembly.

Applicant respectfully submits that none of the cited references either alone or in combination with one another disclose or anticipate Applicant's invention as claimed. None of the cited references either alone or in combination with one another disclose or anticipate the use of channels formed on the die pad for promoting adhesion by allowing the mold compound to flow into the channels and bond with the channels forming a lock between the mold compound and the die flag area to prevent delamination of the semiconductor assembly. The references also fails to disclose or anticipate the plurality of raised wire bond areas on the leadframe for wirebonds. The raised areas allowing the mold compound to get underneath the wirebonds and capture the wirebonds to increase reliability of the wirebonds. Thus, Applicant respectfully submits that the Examiner's rejections of the Claims under 35 U.S.C. § 103(a) has been effectively traversed. Such action is earnestly solicited.

Applicant respectfully submit that Applicant's claimed invention is deserving of patent protection because it describes a useful and functioning apparatus and method which is patentably distinguishable over the prior art.


In conclusion, Applicant respectfully submit that this Amendment Letter, including the amendments to the Claims, and in view of the Remarks offered in conjunction therewith, are fully

r sponsive to all aspects of the objections and rejections tendered by the Examiner in the Office Action. Applicant respectfully submits that he has persuasively demonstrated that the above-identified Patent Application, including Claims 1, 4-8, 10-14, and 24-28 are in condition for allowance. Such action is earnestly solicited.

If the foregoing does not place the case in condition for immediate allowance, the Examiner is respectfully requested to contact the undersigned for purposes of a telephone interview.

If there are any fees incurred by this Amendment Letter, please deduct them from our Deposit Account NO. 23-0830.

Respectfully submitted,


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